

## C L A I M S

1. A radio wave receiver for receiving radio waves having a predetermined frequency, the receiver comprising:

5       an antenna;  
      an variable capacitor connected to the antenna;  
      a memory; and

      a controller which determines an optimum capacitance of the variable capacitor with which the  
10       radio wave receiver is in a predetermined reception state and writes optimum capacitance data into the memory and, controls the variable capacitor based on the optimum capacitance data.

2. The radio wave receiver according to claim 1,  
15       wherein

      the variable capacitor comprises:

          capacitors; and  
          switching elements connected to the capacitors in series, and

20       the controller turns on/off the switching elements based on the optimum capacitance data.

3. The radio wave receiver according to claim 1, wherein the capacitors comprise internal capacitors provided in a capacitor module and external capacitors  
25       provided outside the capacitor module.

4. The radio wave receiver according to claim 1, further comprising a reception state detector which

detects a reception state, and wherein

the controller controls the variable capacitor in such a manner that a capacitance component connected to the antenna gradually varies when receiving the radio waves having the predetermined frequency, and writes optimum capacitance data into the memory when the reception state detector detects the predetermined reception state.

5. The radio wave receiver according to claim 4, wherein the controller varies a capacitance of the variable capacitor in a direction along which a capacitance component to be connected to the antenna is increased, and writes optimum capacitance data into the memory, the optimum capacitance data for setting the capacitance of the variable capacitor to a capacitance immediately before a change of a reception level shifts from an increase to a decrease.

6. The radio wave receiver according to claim 1, wherein

the memory stores at least two sets of optimum capacitance data for receiving radio waves having at least two frequencies, the at least two sets of data are selectively read.

7. The radio wave receiver according to claim 6, wherein the controller writes into the memory at least two sets of optimum capacitance data for receiving the radio waves having the at least two frequencies.

8. The radio wave receiver according to claim 1, wherein the radio waves having the predetermined frequency comprise a standard time signal including a time code.

5        9. The radio wave receiver according to claim 1, having a receiving mode and a tuning mode,

         wherein the controller writes into the memory optimum capacitance data in the tuning mode, and sets a capacitance of the variable capacitor to the optimum  
10        capacitance.

10       10. The radio wave receiver according to claim 1, wherein the variable capacitor comprises:

         a variable capacitance diode; and

         a voltage application circuit which applies  
15        a voltage according to the optimum capacitance data supplied from the controller to the variable capacitance diode.

11. A radio-controlled timepiece comprising:

         a radio wave receiver for receiving radio waves  
20        having a predetermined frequency, the receiver comprising:

         an antenna;

         an variable capacitor connected to the  
         antenna;

25        a memory; and

         a controller which determines an optimum capacitance of the variable capacitor with which the

radio wave receiver is in a predetermined reception state and writes optimum capacitance data into the memory and, controls the variable capacitor based on the optimum capacitance data;

5           a time code generator which generates a time code based on the radio waves received by the radio wave receiver;

          a clocking unit which counts a current time; and

          a correction unit which corrects current time  
10 counted by the clocking unit based on the time code generated by the time code generator.

12. The radio-controlled timepiece according to claim 11, wherein

          the variable capacitor comprises:

15           capacitors; and

          switching elements connected to the capacitors in series, and

          the controller turns on/off the switching elements based on the optimum capacitance data.

20           13. The radio-controlled timepiece according to claim 12, wherein the capacitors comprise internal capacitors provided in a capacitor module and external capacitors provided outside the capacitor module.

          14. The radio-controlled timepiece according to  
25 claim 11, further comprising a reception state detector which detects a reception state, and wherein

          the controller controls the variable capacitor in

such a manner that a capacitance component connected to the antenna gradually varies when receiving the radio waves having the predetermined frequency, and writes optimum capacitance data into the memory when the  
5 reception state detector detects the predetermined reception state.

15. The radio-controlled timepiece according to claim 14, wherein the controller varies a capacitance of the variable capacitor in a direction along which a  
10 capacitance component to be connected to the antenna is increased, and writes optimum capacitance data into the memory, the optimum capacitance data for setting the capacitance of the variable capacitor to a capacitance immediately before a change of a reception level shifts  
15 from an increase to a decrease.

16. The radio-controlled timepiece according to claim 11, wherein

the memory stores at least two sets of optimum capacitance data for receiving radio waves having at  
20 least two frequencies, the at least two sets of data are selectively read.

17. The radio-controlled timepiece according to claim 16, wherein the controller writes into the memory at least two sets of optimum capacitance data for  
25 receiving the radio waves having the at least two frequencies.

18. The radio-controlled timepiece according to

claim 11, wherein

the radio wave receiver having a receiving mode  
and a tuning mode, and

the controller writes into the memory optimum  
5 capacitance data in the tuning mode, and sets a  
capacitance of the variable capacitor to the optimum  
capacitance in the receiving mode.

19. The radio-controlled timepiece according to  
claim 11, wherein the variable capacitor comprises:

10 a variable capacitance diode; and

a voltage application circuit which applies  
a voltage according to the optimum capacitance data  
supplied from the controller to the variable  
capacitance diode.

15 20. A method for setting a tuning capacitance for  
a radio wave receiver for receiving radio waves having  
a predetermined frequency, the method comprising:

determining an optimum capacitance of a variable  
capacitor connected to an antenna with which the radio  
20 wave receiver is in a predetermined reception state;

writing optimum capacitance data into a memory;  
and

controlling the variable capacitor based on the  
optimum capacitance data.

25 21. The method according to claim 20, wherein the  
determining comprises:

gradually varying a capacitance of the variable

capacitor when receiving the radio waves having the predetermined frequency;

detecting a reception state of the radio wave receiver; and

5 determining optimum capacitance data when the predetermined reception state is detected.

22. The method according to claim 21, wherein  
the gradually varying comprises varying a  
capacitance of the variable capacitor in a direction  
10 along which a capacitance component to be connected to the antenna is increased; and

the determining comprises determining as the optimum capacitance data for setting the capacitance of the variable capacitor to a capacitance immediately  
15 before a change of a reception level shifts from an increase to a decrease.